APPENDIX E

CONFIGURATIONS AND DETAILED TEST PROCEDURES

E-4 REMOTE SWITCHING UNIT (RSU). Tables E-4.1 and E-4.2 describe the detailed test procedures for RSUs in normal operating condition (i.e, umbilical connected and not saturated) and stand-alone modes (stand-alone and partial stand-alone). Objectives, criterion and data required for RSUs are contained in appendix D-4.

Table E-4.1. RSU Normal Operating Condition Test Procedures

Ref #	Configuration and/or Diagram		Test Procedure(s)	Expected Result(s)
	Host User Functions:		1. Verify that the RSU provides same user features as the host by repeating the same test procedures conducted for each line type supported on the host. (Refer to appendices referenced below)	1. Applicable requirements per switch type and appropriate GSTP procedures are provided below.
A	**Requirement:** RSU as EOS, SMEO or PBX	**Reference:** GSCR Sect. 2.10.2	**Notes:**	
	Configure an RSU to connect to its host via an umbilical trunk. Test the RSU in conjunction with its host.			

Requirement		GSTP TP	RSU as an: EOS	SMEO	PBX1	PBX2
DSN Interfaces						
Line	2 Wire Analog (Access, Voice, Fax, Data & VTC)	E-2	R	R	R	C[1]
	ISDN BRI NI 1/2 T1.619a (Access, Voice, Fax, Data & VTC)	E-2	R	R	R	C[1]
Features & Capabilities						
Common Features		E-3.1	R[2]	R[2]	R[2]	R[2]
Attendant		E-3.2	R	C	C	C
Public Safety		E-3.3	R[2]	R[2]	C	C
Preset Conferencing		E-3.4	R	C	C	C
Nailed-Up Connections		E-3.5	R	C	C	C
Precedence Access Threshold		E-3.6	C	C	C	C
DSN Hotline Services		E-3.7	R	R	C	C
Network Management		E-3.9	R[2]	R[2]	C	C
ISDN Services		E-3.10	C	C	C	C
Synchronization		E-3.11	R[2]	R[2]	R[2]	R[2]
Reliability		E-3.12	R[2]	R[2]	R[2]	C
Security		E-3.13	R[3]	R[3]	R[3]	C
VoIP						
VoIP Systems		E-5.1	C[4]	C[4]	C[4]	C[4]
LANs		E-5.2	C[4]	C[4]	C[4]	C[4]
Network Gateways						
PSTN		E-6.1	R	R	R	C
Tactical		E-6.2	R	C	NA	NA
NCS (DRSN)		E-6.3	R	C	NA	NA
EMSS		E-6.4	C[5]	C[5]	C[5]	C[5]
NGCS		E-6.5	C[9]	C[5]	C[5]	C[5]

Notes:

1. For PBX2, either 2W analog or ISDN BRI NI 1/2 (non-MLPP) may be provided.
2. Not all requirements of the section apply. See detailed requirements list in Appendix C for specific list of requirements that apply.
3. GSCR security requirements are verified through LoC and DISA's IATP.
4. VoIP service need not be provided and is therefore conditional. If provided, VoIP systems will be tested IAW D-6 test procedures.
5. CJCS approved requirements not yet defined. Test procedures to be developed.

Table E-4.1. RSU Normal Operating Condition Test Procedures (continued)

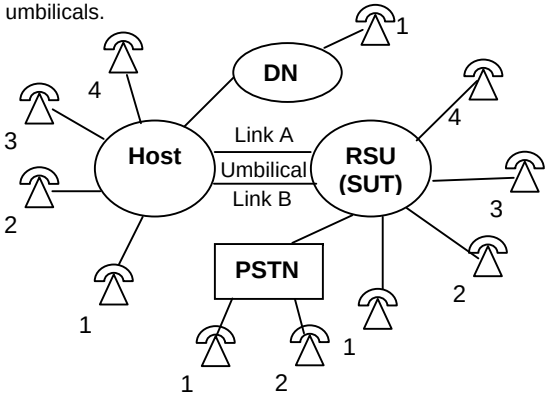
<table>
<tr><th>Ref #</th><th>Configuration and/or Diagram</th><th>Test Procedure(s)</th><th>Expected Result(s)</th></tr>
<tr><td>B</td><td>Diverse Routing
Requirement: RSU as EOS, or SMEO (If RSU is tested as a PBX1 not required)
Reference: GSCR Sect. 2.10.2
Configure the RSU to have two umbilical connections and a PSTN connection. Provision four subscribers on host (H1-H4), four on RSU (R1-R4) and two on emulated PSTN (P1 & P2). Ensure RSU redundant signaling is configured on both umbilicals.
 
</td><td>1. Break Link A.
2. Place ROUTINE call from R1 to H1.
3. Place call from R2 to P1.
4. Place PRIORITY call from R3 to H1.
5. Place PRIORITY call from R4 to DN1
6. Hang up calls.
7. Place PRIORITY call from DN1 to R1.
8. Place a ROUTINE call from H1 to R2
9. Place ROUTINE call from R1 to H1.
10. Place PRIORITY call from R3 to H1.
11. Hang up calls.
12. Restore Link A
13. Break Link B (Repeat steps 2 thru 11)</td><td>1. Host and RSU Reports PSA alarm. Y/N
2. Call completes Y/N
3. Call Completes. Y/N
4. Call completes. Y/N
5. Call completes. Y/N
6. Calls end. Y/N
7. Call completes Y/N
8. Call completes Y/N
9. Call completes Y/N
10. Call completes Y/N
11. Calls end Y/N
12. Host RSU Reports PSA alarm clears Y/N
13. Alarm reported and calls complete Y/N
Notes:</td></tr>
<tr><td>C</td><td>RSU Functions
Requirement: RSU as EOS, SMEO or PBX
Reference: GSCR Sect. 2.10.2
Configure the RSU per Ref B above but connect to the host via a single umbilical. Configure a Display phone on the Host to verify ANI. If display phone is not available, use Call Data Records (CDR).</td><td>Verify that the RSU can support:
1. Loop/ground start signaling
2. DP & DTMF signaling
3. Make a ROUTINE call from R1 to H1.
4. Verify that the host receives ANI info.
5. Verify at the host that RSU lines are uniquely identified. (e.g. unique equipment number)
6. Verify that RSU provides NM traffic measurement on hourly basis. (place below calls immediately after the hour e.g. 8:00 am)
- Place 5 calls from R1 to H1 (1 min duration)
- Place 5 calls from H2 to R2 (1 min duration)
- Place 5 calls from R1 to R2 (1 min duration)
- Maintenance busy two trunks on umbilical (duration 1 min)
7. Invoke several alarms at the RSU. Verify that Host-RSU system can detect & report alarms.
8. Verify that Host-RSU system can support manual diagnostics.
Notes:</td><td>RSU supports:
1. Loop/ground start signaling Y/N
2. DP & DTMF signaling supported Y/N
3. Call completes. Y/N
4. Host receives ANI Y/N
5. RSU lines uniquely identified at host. Y/N
6. RSU provides:
Total originations from RSU = 10 Y/N
Total intra-RSU call attempts = 5 Y/N
Total incoming call attempts. = 5 Y/N
Total outgoing call attempts. = 5 Y/N
Overflow counts. Y/N
Usage (minus maintenance) approx 15 min Y/N
Maintenance usage approx 2 min. Y/N
7. Alarms detected by Host-RSU system Y/N
8. Manual diagnostics supported by Host-RSU System Y/N</td></tr>
</table>

Table E-4.2. RSU Degraded Operating Condition Test Procedures

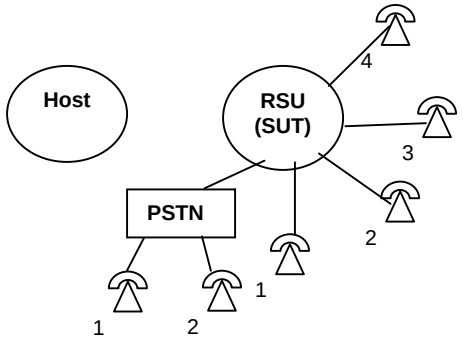
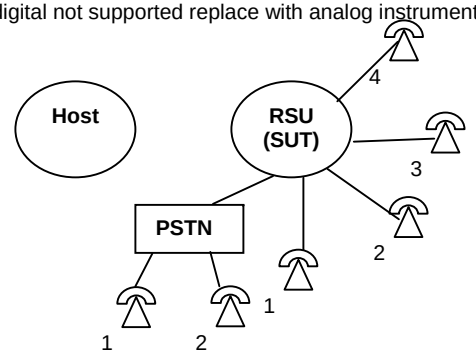
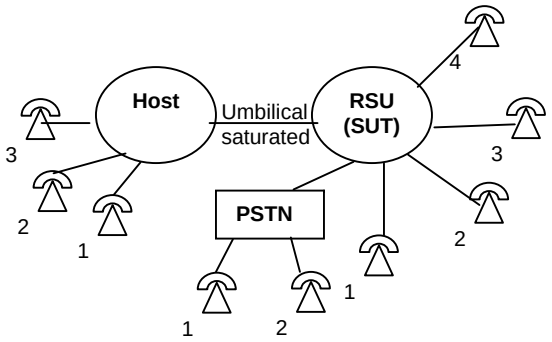
Ref #	Configuration and/or Diagram	Test Procedure(s)	Expected Result(s)
A	**Stand-Alone (SA) Host Access & Alarm** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR sect. 2.10.3.1 Sever the umbilical(s) between Host and RSU.  Note: Use all line interface types available on RSU for this test (i.e. BRI, VoIP, Analog, Digital)	Prior to severing the Host to RSU umbilical links establish the following calls: R1 to R2 @ ROUTINE R3 to R4 @ PRIORITY R2 to P1 1. Sever the Host to RSU umbilical links 2. Verify at Host system indicates SA mode alarm. 3. Verify at RSU visual alarm indicates SA mode. 4. Place all instruments on hook. 5. Place a call from P1 to R4 (RSU as EO, or SMEO only) 6. Place a call from R1 to P2 (RSU as EO, or SMEO only) 7. Place a ROUTINE call from R2 to R3 8. Place all instruments on hook	1. All established calls remain connected Y/N 2. Alarm indicates SA mode. Y/N 3. Alarm indicates SA mode. Y/N 4. All instruments on hook Y/N 5. P1 to R4 call completed Y/N 6. R1 to P2 call completed Y/N 7. R2 to P3 call completed Y/N **Notes:**
B	**Stand-Alone (SA) MLPP** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.1 Sever the umbilical(s) between Host and RSU. Configure R1 as BRI, R2, and R3 as analog, and R4 as digital telephones) (If digital not supported replace with analog instruments)  	MLPP: 1. Place ROUTINE call from R1 to R2. 2. Place IMMEDIATE call from R3 to R2. 3. Place FLASH call from R4 to R3. 4. Place a Flash Override call from R2 to R4 5. Hang up all calls. 6. Place ROUTINE call from R1 to P1 without 94 access. 7. Place ROUTINE call from R2 to R3 with 94 access. 8. Reestablish umbilical connection.	1. Call completes. Y/N 2. Call completes. Y/N R1 & R2 preempted & receives PNT. Y/N 3. Call completes. Y/N R3 & R2 preempted & receives PNT. Y/N 4. R4 and R3 Preempted and receives PNT Y/N 5. Calls end. Y/N 6. Call completes. Y/N 7. Call completes. Y/N 8. SA alarms clear at RSU and host. Y/N R1-P1 call remains up. Y/N R2-R3 call remains up. Y/N **Notes:**

Table E-4.2. RSU Degraded Operating Condition Test Procedures (continued)

<table>
<tr><th>Ref #</th><th>Configuration and/or Diagram</th><th>Test Procedure(s)</th><th>Expected Result(s)</th></tr>
<tr><td>C</td><td>Partial Stand-Alone (PSA) Host Access & Alarm
Requirement: RSU as EOS, SMEO or PBX | Reference: GSCR Sect. 2.10.3.1</td><td>Alarm:
Tested under Ref B Diverse Routing

Notes:</td><td></td></tr>
<tr><td>D</td><td>Partial Stand-Alone (PSA) MLPP
Requirement: RSU as EOS, SMEO or PBX | Reference: GSCR Sect. 2.10.3.2
Configure an umbilical between Host and RSU. Busy all but 2 trunks.
 
</td><td>Preempt for reuse (answered):
1. Place a ROUTINE call from R1 to H1.
2. Place a ROUTINE call from R2 to H2.
3. Place a PRIORITY call from R3 to H3.

4. Place all instruments on hook.
5. Place a ROUTINE call from R1 to H1.
6. Place a PRIORITY call from R2 to H2.
7. Place an IMMEDIATE call from H3 to R3.

8. Place all instruments on hook.
9. Place a PRIORITY call from R2 to H2.
10. Place an IMMEDIATE call from R1 to H1.
11. Place a FLASH call from H3 to R2.

12. Place all instruments on hook.
13. Place an IMMEDIATE call from R1 to H1.
14. Place a FLASH call from R2 to H2.
15. Place a FLASH OVERRIDE call from H3 to R3.

Notes:</td><td>Preempt for reuse (answered):
1. Call completes. Y/N
2. Call completes. Y/N
3. Call completes and preempts ROUTINE call. Y/N
Both preempted parties receive PNT. Y/N
ROUTINE trunk reused. Y/N
4. Calls end. Y/N
5. Call completes. Y/N
6. Call completes. Y/N
7. Call completes and preempts ROUTINE call. Y/N
Both preempted parties receive PNT. Y/N
ROUTINE trunk reused. Y/N
8. Calls end. Y/N
9. Call completes. Y/N
10. Call completes. Y/N
11. Call completes and preempts PRIORITY call. Y/N
Both preempted parties receive PNT. Y/N
PRIORITY trunk reused. Y/N
12. Calls end. Y/N
13. Call completes. Y/N
14. Call completes. Y/N
15. Call completes and preempts IMMEDIATE call. Y/N
Both preempted parties receive PNT. Y/N
IMMEDIATE trunk reused. Y/N</td></tr>
</table>

Table E-4.2. RSU Degraded Operating Condition Test Procedures (continued)

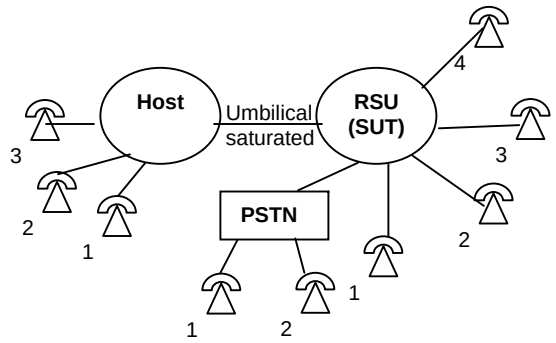
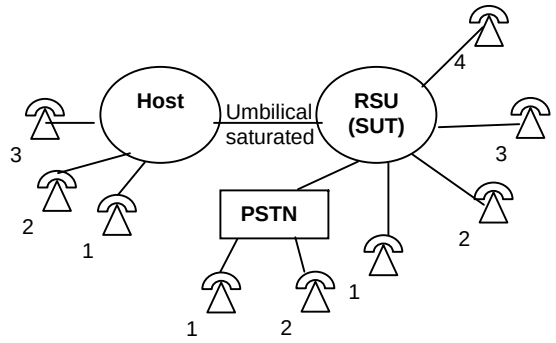
Ref #	Configuration and/or Diagram	Test Procedure(s)	Expected Result(s)
D continued	**Partial Stand-Alone (PSA) MLPP** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.2 Configure an umbilical between Host and RSU. Busy all but 2 trunks. Configure R1- R4 to have assured dial tone. 	Preempt for Reuse (answered): 16. Place all instruments on hook. 17. Place a FLASH call from R1 to H1. 18. Place a FLASH OVERRIDE call from R2 to H2. 19. Place a FLASH OVERRIDE call from R3 to H3. 20. Place all instruments on hook. 21. Place a FLASH OVERRIDE call from R1 to H1. 22. Place a FLASH OVERRIDE call from R2 to H2. 23. Place a FLASH OVERRIDE call from R3 to H3. 24. Place all instruments on hook. **Notes:**	Preempt for Reuse (answered): 16. Calls end. Y/N 17. Call completes. Y/N 18. Call completes. Y/N 19. Call completes and preempts FLASH call. Y/N Both preempted parties receive PNT. Y/N FLASH trunk reused. Y/N 20. Calls end. Y/N 21. Call completes. Y/N 22. Call completes. Y/N 23. R3 receives BPA. Y/N 24. Calls end. Y/N
E	**Partial Stand-Alone (PSA) MLPP** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.2 Configure an umbilical between Host and RSU. Busy all but 2 trunks. Configure R1- R4 to have assured dial tone. 	Preempt for Reuse (Unanswered): 1. Originate a ROUTINE call from H1 toR1 and allow call to ring-no-answer. 2. Originate a PRIORITY call from H2 to R2 and allow call to ring-no-answer. 3. Place an IMMEDIATE call from R3 to H3. 4. Place all instruments on hook. **Notes:**	Preempt for Reuse (Unanswered): 1. R1 ringing. Y/N 2. R2 ringing. Y/N 3. Call completes and preempts ROUTINE call. Y/N R1 receives PNT Y/N ROUTINE trunk reused. Y/N 4. Calls end. Y/N

Table E-4.2. RSU Degraded Operating Condition Test Procedures (continued)

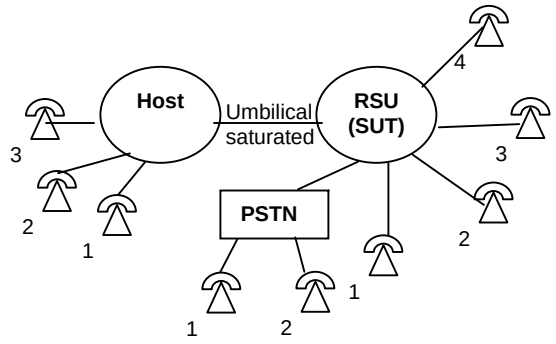
Ref #	Configuration and/or Diagram	Test Procedure(s)	Expected Result(s)
E c o n t i n u e d	**Partial Stand-Alone (PSA):** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.2 Configure an umbilical between Host and RSU. Busy all but 2 trunks. Configure R1- R4 to have assured dial tone.  	Preempt for Reuse (Unanswered): 9. Originate a PRIORITY call from R1 to H1 and allow call to ring-no-answer. 10. Originate an IMMEDIATE call from R2 to H2 and allow call to ring-no-answer. 11. Place a FLASH call from R3 to H3. 12. Place all instruments on hook. 13. Originate an IMMEDIATE call from R1 to H1 and allow call to ring-no-answer. 14. Originate a FLASH call from R2 to H2 and allow call to ring-no-answer. 15. Place a FLASH OVERRIDE call from R3 to H3. 16. Place all instruments on hook. 17. Originate a FLASH call from R1 to H1 and allow call to ring-no-answer. 18. Originate a FLASH OVERRIDE call from R2 to H2 and allow call to ring-no-answer. 19. Place a FLASH OVERRIDE call from R3 to H3. 20. Place all instruments on hook. 21. Originate a FLASH OVERRIDE call from R1 to H1 and allow call to ring-no-answer. 22. Originate a FLASH OVERRIDE call from R2 to H2 and allow call to ring-no-answer. 23. Place a FLASH OVERRIDE call from R3 to H3. 24. Place all instruments on hook.	Preempt for Reuse (Unanswered): 9. H1 ringing. Y/N 10. H2 ringing. Y/N 11. Call completes and preempts PRIORITY call. Y/N R1 receives PNT Y/N PRIORITY trunk reused. Y/N 12. Calls end. Y/N 13. H1 ringing. Y/N 14. H2 ringing. Y/N 15. Call complete and preempted IMMEDIATE call. Y/N R1receives PNT Y/N IMMEDIATE trunk reused. Y/N 16. Calls end. Y/N 17. H1 ringing. Y/N 18. H2 ringing. Y/N 19. Call complete and preempted FLASH call. Y/N R1 receives PNT Y/N FLASH trunk reused. Y/N 20. Calls end. Y/N 21. H1 ringing. Y/N 22. H2 ringing. Y/N 23 R3 receives BPA. Y/N 24. Calls end. Y/N **Notes:**

Table E-4.2. RSU Degraded Operating Condition Test Procedures (continued)

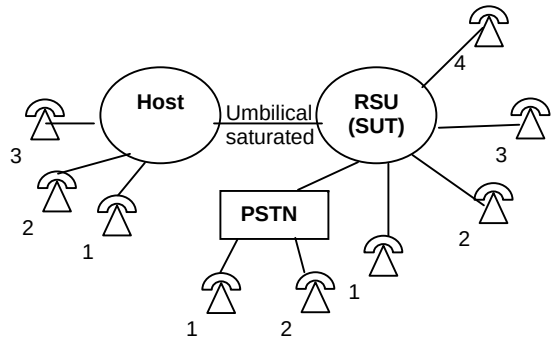
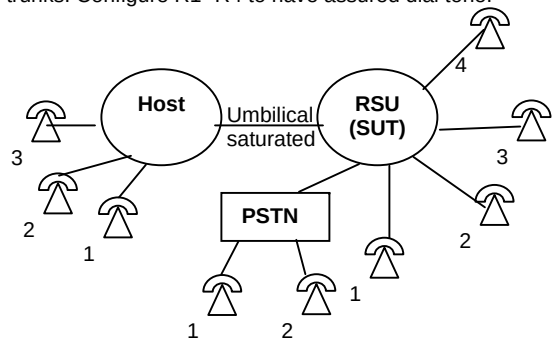
Ref #	Configuration and/or Diagram	Test Procedure(s)	Expected Result(s)
F	**Partial Stand-Alone (PSA) MLPP** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.2 Configure an umbilical between Host and RSU. Busy all but 2 trunks. Configure R1- R4 to have assured dial tone.  	Preempt Not for Reuse (Answered): 1. Place a ROUTINE call from R1 to H1. 2. Place a PRIORITY call from R2 to R1. 3. Place all instruments on hook. 4. Place a PRIORITY call from R1 to H1. 5. Place an IMMEDIATE call from R2 to R1. 6. Place all instruments on hook. 7. Place an IMMEDIATE call from R1 to H1. 8. Place a FLASH call from R2 to R1. 9. Place all instruments on hook. 10. Place a FLASH call from R1 to H1. 11. Place a FLASH OVERRIDE call from R2 to R1. 12. Place all instruments on hook. 13. Place a FLASH OVERRIDE call from R1 to H1. 14. Place a FLASH OVERRIDE call from R2 to R1. 15. Place all instruments on hook. **Notes:**	Preempt Not for Reuse (Answered): 1. Call completes. Y/N 2. Call completes and preempts ROUTINE call Y/N Both preempted parties receive PNT. Y/N ROUTINE trunk returned idle Y/N 3. Call ends. Y/N 4. Call completes. Y/N 5. Call completes and preempts PRIORITY call. Y/N Both preempted parties receive PNT. Y/N PRIORITY trunk returned idle. Y/N 6. Call ends. Y/N 7. Call completes. Y/N 8. Call completes and preempts IMMEDIATE call. Y/N Both preempted parties receive PNT. Y/N IMMEDIATE trunk returned idle. Y/N 9. Call ends. Y/N 10. Call completes. Y/N 11. Call completes and preempts FLASH call. Y/N Both preempted parties receive PNT. Y/N FLASH trunk returned idle. Y/N 12. Call ends. Y/N 13. Call completes. Y/N 14. Originator B receives BPA. Y/N 15. Call ends. Y/N
G	**Partial Stand-Alone (PSA) MLPP** **Requirement:** RSU as EOS, SMEO or PBX **Reference:** GSCR Sect. 2.10.3.2 Configure an umbilical between Host and RSU. Busy all but 2 trunks. Configure R1- R4 to have assured dial tone.  	Preempt Not for Reuse (Unanswered): 1. Originate a ROUTINE call from R1 to H1 and allow call to ring-no-answer. 2. Place a PRIORITY call from R2 to R1. 3. Place all instruments on hook. 4. Originate a PRIORITY call from R1 to H1 and allow call to ring-no-answer. 5. Place an IMMEDIATE call from R2 to R1. 6. Place all instruments on hook. **Notes:**	Preempt Not for Reuse (Unanswered): 1. H1 ringing. Y/N 2. Call completes and preempts ROUTINE call. Y/N R1 received PNT. Y/N ROUTINE trunk returned idle. Y/N 3. Call ends. Y/N 4. H1 ringing. Y/N 5. Call completes and preempts PRIORITY call. Y/N R1 received PNT. Y/N PRIORITY trunk returned idle. Y/N 6. Call ends. Y/N

Table E-4.2. RSU Degraded Operating Condition Test Procedures (continued)

Legend:

2W – **2 Wire Analog**
BPA – Blocked Precedence Announcement
BRI – Basic Rate Interface
C – Conditional
CAS – Channel Associated Signaling
CJCS – **Chairman Joint Chiefs of Staff**
DP – Dial Pulse
DRSN – Defense Red Switch Network
DSN – Defense Switched Network
DTMF – Dual Tone Multi-Frequency
E1 – European Transmission Std. (2.048 Mbps)
EMSS – Enhanced Mobile Satellite System
EOS – End Office Switch
GSCR – Generic Switching Center Requirements
GSTP – Generic Switch Test Plan
IATP – Information Assurance Test Plan
IAW – **In accordance with**
ISDN – Integrated Services Digital Network
LAN – Local Area Network
LoC – Letter(s) of Compliance
Mbps – Megabits per second
MFR1 – Multi-Frequency Recommendation 1
MLPP – **Multi-level Precedence and Preemption**
NA – Not Applicable
NATO – North Atlantic Treaty Organization
NCS – National Communications System
NGCS – NATO Gateway Communications System
NI 1/2 – National ISDN Std. 1/2
PBX1 – Private Branch Exchange Type 1
PBX2 – Private Branch Exchange Type 2
PRI – Primary Rate Interface
PSTN – Public Switched Telephone System
R – Required
Ref – Reference
RSU – Remote Switching Unit
SMEO – Small End Office
Std – Standard
T1 – American Transmission Std. (1.544 Mbps)
T1.619a – SS7 and ISDN Signaling Std. For T1
TP – Test Procedure
VoIP – Voice over Internet Protocol
VTC – Video Teleconferencing